REMARKS

Applicant respectfully requests reconsideration of this application in view of the foregoing amendment and following remarks.

Status of the Claims

Claims 1, 2, 4-8, 10, 11, 13-16, 18 and 19 are pending in this application. Claims 8, 10, 11, 13-16, 18 and 19 are withdrawn from consideration. Claims 1, 2 and 4-7 stand rejected. By this amendment, claim 1 is amended. Claims 8, 10, 11, 13-16, 18 and 19 are cancelled without prejudice or disclaimer. No new matter has been added by this amendment.

Rejection under 35 U.S.C. §103

Claims 1, 2 and 4-7 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,777,768 to Korevaar ("Korevaar").

Korevaar is directed to a free space communication system, which includes a first and second terminal each containing a plurality of laser transmitters. The laser transmitters generate several laser beams each carrying a communication signal. [Korevaar, Abstract]. The laser transmitters are pointed by steering assemblies. [Korevaar, Col 5, lines 22-23]. The steering assemblies can be either independent gimbals which are useful for steering the laser transmitters in separately, or there can be a single steering assembly which has a single gimbal for collectively holding and steering all of the multiple laser transmitters. [Korevaar, Col 5, lines 32-37].

The Final Office Action asserts that Korevaar discloses that "irradiation patterns of light beams from at least two of the plurality of light-emitting units overlap in the shorter diameter direction of the irradiation pattern." [07/25/2007 Office Action at 3]. To support this assertion, the office action cites Korevaar at Figure 5B, column 6, lines 16-22, column 8, lines 4-8, and

column 9, lines 29-36. [07/25/2007 Office Action at 3]. With respect to Figure 5B, the Final Office Action asserts it discloses "an arrangement of two elliptical irradiation pattern 78a and 78b . . . which, given the divergence of the beams expressly disclosed by Korevaar, eventually "overlap in the shorter diameter direction of the irradiation pattern" at the receiver. [07/25/2007 Office Action at 3].

Figure 5B of Korevaar (reproduced below) is a front view of an optical configuration fro a terminal wherein the laser beams are transmitted from the terminal along substantially the same path as the incoming light from the other terminal.

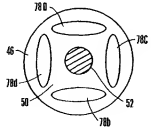

Fig. 5B

Korevaar describes Figure 5B as follows:

> FIGS. 5A and 5B show another embodiment for a laser communications terminal 12, 14 utilizing the invention which is appropriate for terrestrial laser communications (for instance between buildings) up to a range of about ten kilometers (10 km).
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> FIG. 5B shows the beam locations 78 at the front of the eight inch telescope aperture 46 used in this embodiment. As implied above, the laser beams 20a-b will then pass through aperture 46 toward the other terminal. In general, if diode lasers are used, the transmitted beams may be elliptical. Using 50 mW peak power communications transmit lasers with a duty factor of 50%, the beams can be expanded to meet eye safety standards. At the same time, the received light signal 44 passes through receive aperture 46 except for the part obscured by secondary mirror 52.[Korevaar, Col 7, lines 35-39; Col 8, lines 4-14].

From Korevaar's discussion of Figure 5B, all that can be said about the laser emanating from beam locations 78 is that they appear to be pointed in a substantially parallel path, and due to divergence in each of the transmitted beams, they will, at least to some extent, overlap one another in the far field. [See, Korevaar, Col 3, lines 40-45]. Applicant notes, however, that Korevaar's description of Figure 5B lacks any indication of how these laser beams will overlap in the far field.

Further, Applicant's review of the text cited by the Final Office Action finds that, at best, it merely discloses a free space optics communication system with laser beams that overlap in the far field:

> Further, it is important that all of the laser beams 20 emanating from separate spatial locations in terminal 12 overlap in the far field 30 to achieve a reduction in signal fluctuations at the receiver 34 in terminal 14. Thus, the required power of each laser transmitter 26a-c is reduced by far more than would be expected from just summing the laser output powers. [Korevaar, Col 6, lines 16-22].
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> * * *
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> In the above disclosure, there has been mention of the divergence of the laser beams 20 as the emanate from terminal 12, 14. The importance of this divergence, of course, based on the intention of the system 10 that all of the laser beams 20 overlap in the far field. This divergence and overlap, however can not be haphazard. For the present invention, these characteristics of the laser beams 20 must be somehow controlled and, therefore, made predictable. [Korevaar, Col 9, lines 31-36].
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> FIG. 5B shows the beam locations 78 at the front of the eight inch telescope aperture 46 used in this embodiment. As implied above, the laser beams 20a-b will then pass through aperture 46 toward the other terminal. In general, if diode lasers are used, the transmitted beams may be elliptical. [Korevaar, Co 8, lines 4-8].

Like Korevaar's description of Figure 5B, in the above referenced text, Korevaar does not mention any direction of overlap (i.e., the shorter diameter direction or the longer diameter direction) of laser beams.

Therefore, Korevaar does not teach, disclose or suggest "at least two of the plurality of light-emitting units overlap in the shorter diameter direction of the irradiation pattern of the light beam from the one light-emitting unit at a light-receiving unit of the other apparatus" as recited in Applicant's claim 1.

Accordingly, at least independent claim 1 and its dependent claims 2 and 4-7 are respectfully asserted to be in condition for allowance.

Nonetheless, claim 1 has been amended for further clarification. In particular, amended claim 1 recites, *inter alia*, "wherein ... and respective optical axes of the plurality of light-emitting units are inclined with respect to a reference axis of the free space optics communication apparatus so that a width of a combined irradiation pattern formed by combining the light beams from the plurality of light-emitting units in a shorter diameter direction of an irradiation pattern of a light beam from one of the plurality of light-emitting units is 1.5 times or more larger than a width in the shorter diameter direction of the irradiation pattern of the light beam from the one light-emitting unit." Support for the amendment may be found, e.g., paragraph [0032] along with Fig. 2 of the specification as originally filed.

One of the aspects of the present invention is directed to that respective optical axes of a plurality of light-emitting units are inclined with respect to a reference axis of a free space optics communication apparatus so that a width of a combined irradiation pattern is 1.5 times or more larger than a width in the shorter diameter direction of the irradiation pattern of the light beam from the one light-emitting unit.

With the features of the claimed invention as indicated above, several beneficial effects can be achieved such as disclosed at paragraphs [0034]-[0035] of the original specification. For example, by inclining the optical axis of the light-emitting unit with respect to the reference axis

of the free space optics communication apparatus, it is possible to overlap irradiation patterns of light beams from at least two of the plurality of light-emitting units in the shorter diameter direction of the irradiation pattern of the light beam from the one light-emitting unit at a light-receiving unit of the other apparatus.

Applicant notes that Korevaar does not teach or suggest the above features of the present invention. As is clear from Figs. 4A, 5A and 6A of Korevaar, respective optical axes of a plurality of transmitters 26 are not inclined with respect to a reference axis of base 48 which is line perpendicular to a mirror 52. That is, optical axis of transmitter 26 of Korevaar is parallel to the reference axis of base 48 (terminal 12). If the optical axis of the light-emitting unit is to be parallel to the reference axis of free space optics communication apparatus, a plurality of irradiation patterns mostly overlaps with each other depending on distance between the free space optics communication apparatus and another apparatus. In this case, it is difficult to broaden the width of the combined irradiation pattern.

In view of the above, Applicants believe that claim 1 as amended and its dependent claims 2 and 4-7 further distinguish over the cited reference (i.e., Korevaar) for at least the reasons discussed above.

Reconsideration and withdrawal of the rejection of claims 1, 2 and 4-7 under 37 U.S.C. §103(a) is respectfully requested.

Applicant has chosen in the interest of expediting prosecution of this patent application to distinguish the cited documents from the pending claims as set forth above. However, these statements should not be regarded in any way as admissions that the cited documents are, in fact, prior art.

Applicant believes that the application as amended is in condition for allowance and such

action is respectfully requested.

AUTHORIZATION

No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicant hereby petitions the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 13-4500 (Order No. 1232-5123). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

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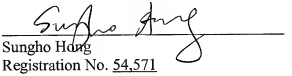
By: 
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